

0300



OIPE

RAW SEQUENCE LISTING

DATE: 07/30/2002

PATENT APPLICATION: US/09/834,998A

TIME: 15:05:20

Input Set : A:\0399.2004-002SEQLIST.TXT

Output Set: N:\CRF3\07302002\I834998A.raw

4 <110> APPLICANT: Gaxiola, Roberto A.
 5 Fink, Gerald R.
 6 Alper, Seth L.
 8 <120> TITLE OF INVENTION: Proton Transporters And Uses In Plants
 11 <130> FILE REFERENCE: 0399.2004-002
 13 <140> CURRENT APPLICATION NUMBER: US 09/834,998A
 14 <141> CURRENT FILING DATE: 2001-04-13
 16 <150> PRIOR APPLICATION NUMBER: US 09/644,039
 17 <151> PRIOR FILING DATE: 2000-08-22
 19 <150> PRIOR APPLICATION NUMBER: US 60/164,808
 20 <151> PRIOR FILING DATE: 1999-11-10
 22 <160> NUMBER OF SEQ ID NOS: 5
 24 <170> SOFTWARE: FastSEQ for Windows Version 4.0
 26 <210> SEQ ID NO: 1
 27 <211> LENGTH: 538
 28 <212> TYPE: PRT
 29 <213> ORGANISM: Artificial Sequence
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 33 <223> OTHER INFORMATION: Arabidopsis - AtNhxl
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 38 His Ala Ser Val Val Ala Leu Asn Leu Phe Val Ala Leu Leu Cys Ala
 39 20 25 30
 40 Cys Ile Val Leu Gly His Leu Leu Glu Glu Asn Arg Trp Met Asn Glu
 41 35 40 45
 42 Ser Ile Thr Ala Leu Leu Ile Gly Leu Gly Thr Gly Val Thr Ile Leu
 43 50 55 60
 44 Leu Ile Ser Lys Gly Lys Ser Ser His Leu Leu Val Phe Ser Glu Asp
 45 65 70 75 80
 46 Leu Phe Phe Ile Tyr Leu Leu Pro Pro Ile Ile Phe Asn Ala Gly Phe
 47 85 90 95
 48 Gln Val Lys Lys Lys Gln Phe Phe Arg Asn Phe Val Thr Ile Met Leu
 49 100 105 110
 50 Phe Gly Ala Val Gly Thr Ile Ile Ser Cys Thr Ile Ile Ser Leu Gly
 51 115 120 125
 52 Val Thr Gln Phe Phe Lys Lys Leu Asp Ile Gly Thr Phe Asp Leu Gly
 53 130 135 140
 54 Asp Tyr Leu Ala Ile Gly Ala Ile Phe Ala Ala Thr Asp Ser Val Cys
 55 145 150 155 160
 56 Thr Leu Gln Val Leu Asn Gln Asp Glu Thr Pro Leu Leu Tyr Ser Leu
 57 165 170 175
 58 Val Phe Gly Glu Gly Val Val Asn Asp Ala Thr Ser Val Val Val Phe

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59          180          185          190
60 Asn Ala Ile Gln Ser Phe Asp Leu Thr His Leu Asn His Glu Ala Ala
61          195          200          205
62 Phe His Leu Leu Gly Asn Phe Leu Tyr Leu Phe Leu Leu Ser Thr Leu
63          210          215          220
64 Leu Gly Ala Ala Thr Gly Leu Ile Ser Ala Tyr Val Ile Lys Lys Leu
65 225          230          235          240
66 Tyr Phe Gly Arg His Ser Thr Asp Arg Glu Val Ala Leu Met Met Leu
67          245          250          255
68 Met Ala Tyr Leu Ser Tyr Met Leu Ala Glu Leu Phe Asp Leu Ser Gly
69          260          265          270
70 Ile Leu Thr Val Phe Phe Cys Gly Ile Val Met Ser His Tyr Thr Trp
71          275          280          285
72 His Asn Val Thr Glu Ser Ser Arg Ile Thr Thr Lys His Thr Phe Ala
73          290          295          300
74 Thr Leu Ser Phe Leu Ala Glu Thr Phe Ile Phe Leu Tyr Val Gly Met
75 305          310          315          320
76 Asp Ala Leu Asp Ile Asp Lys Trp Arg Ser Val Ser Asp Thr Pro Gly
77          325          330          335
78 Thr Ser Ile Ala Val Ser Ser Ile Leu Met Gly Leu Val Met Val Gly
79          340          345          350
80 Arg Ala Ala Phe Val Phe Pro Leu Ser Phe Leu Ser Asn Leu Ala Lys
81          355          360          365
82 Lys Asn Gln Ser Glu Lys Ile Asn Phe Asn Met Gln Val Val Ile Trp
83          370          375          380
84 Trp Ser Gly Leu Met Arg Gly Ala Val Ser Met Ala Leu Ala Tyr Asn
85 385          390          395          400
86 Lys Phe Thr Arg Ala Gly His Thr Asp Val Arg Gly Asn Ala Ile Met
87          405          410          415
88 Ile Thr Ser Thr Ile Thr Val Cys Leu Phe Ser Thr Val Val Phe Gly
89          420          425          430
90 Met Leu Thr Lys Pro Leu Ile Ser Tyr Leu Leu Pro His Gln Asn Ala
91          435          440          445
92 Thr Thr Ser Met Leu Ser Asp Asp Asn Thr Pro Lys Ser Ile His Ile
93          450          455          460
94 Pro Leu Leu Asp Gln Asp Ser Phe Ile Glu Pro Ser Gly Asn His Asn
95 465          470          475          480
96 Val Pro Arg Pro Asp Ser Ile Arg Gly Phe Leu Thr Arg Pro Thr Arg
97          485          490          495
98 Thr Val His Tyr Tyr Trp Arg Gln Phe Asp Asp Ser Phe Met Arg Pro
99          500          505          510
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106 <210> SEQ ID NO: 2
107 <211> LENGTH: 669
108 <212> TYPE: PRT
109 <213> ORGANISM: Artificial Sequence

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112 <223> OTHER INFORMATION: Human - HsNhe-6
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117 Ser Ser Pro Arg Ala Arg Arg Leu Met Arg Pro Leu Trp Leu Leu
118 20 25 30
119 Ala Val Gly Val Phe Asp Trp Ala Gly Ala Ser Asp Gly Gly Gly Gly
120 35 40 45
121 Glu Ala Arg Ala Met Asp Glu Glu Ile Val Ser Glu Lys Gln Ala Glu
122 50 55 60
123 Glu Ser His Arg Gln Asp Ser Ala Asn Leu Leu Ile Phe Ile Leu Leu
124 65 70 75 80
125 Leu Thr Leu Thr Ile Leu Thr Ile Trp Leu Phe Lys His Arg Arg Ala
126 85 90 95
127 Arg Phe Leu His Glu Thr Gly Leu Ala Met Ile Tyr Gly Leu Leu Val
128 100 105 110
129 Gly Leu Val Leu His Tyr Gly Ile His Val Pro Ser Asp Val Asn Asn
130 115 120 125
131 Val Thr Leu Ser Cys Glu Val Gln Ser Ser Pro Thr Thr Leu Leu Val
132 130 135 140
133 Thr Phe Asp Pro Glu Val Phe Phe Asn Ile Leu Leu Pro Pro Ile Ile
134 145 150 155 160
135 Phe Tyr Ala Gly Tyr Ser Leu Lys Arg Arg His Phe Phe Arg Asn Leu
136 165 170 175
137 Gly Ser Ile Leu Ala Tyr Ala Phe Leu Gly Thr Ala Ile Ser Cys Phe
138 180 185 190
139 Val Ile Gly Ser Ile Met Tyr Gly Gly Val Thr Leu Met Lys Val Thr
140 195 200 205
141 Gly Gln Leu Ala Gly Asp Phe Tyr Phe Thr Asp Cys Leu Leu Phe Gly
142 210 215 220
143 Ala Ile Val Ser Ala Thr Asp Pro Val Thr Val Leu Ala Ile Phe His
144 225 230 235 240
145 Glu Leu Gln Val Asp Val Glu Leu Tyr Ala Leu Leu Phe Gly Glu Ser
146 245 250 255
147 Val Leu Asn Asp Ala Val Ala Ile Val Leu Ser Ser Ser Ile Val Ala
148 260 265 270
149 Tyr Gln Pro Ala Gly Asp Asn Ser His Thr Phe Asp Val Thr Ala Met
150 275 280 285
151 Phe Lys Ser Ile Gly Ile Phe Leu Gly Ile Phe Ser Gly Ser Phe Ala
152 290 295 300
153 Met Gly Ala Ala Thr Gly Val Val Thr Ala Leu Val Thr Lys Phe Thr
154 305 310 315 320
155 Lys Leu Arg Glu Phe Gln Leu Leu Glu Thr Gly Leu Phe Phe Leu Met
156 325 330 335
157 Ser Trp Ser Thr Phe Leu Leu Ala Glu Ala Trp Gly Phe Thr Gly Val
158 340 345 350
159 Val Ala Val Leu Phe Cys Gly Ile Thr Gln Ala His Tyr Thr Tyr Asn
160 355 360 365

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161 Asn Leu Ser Thr Glu Ser Gln His Arg Thr Lys Gln Leu Phe Glu Leu
162      370      375      380
163 Leu Asn Phe Leu Ala Glu Asn Phe Ile Phe Ser Tyr Met Gly Leu Thr
164 385      390      395      400
165 Leu Phe Thr Phe Gln Asn His Val Phe Asn Pro Thr Phe Val Val Gly
166      405      410      415
167 Ala Phe Val Ala Ile Phe Leu Gly Arg Ala Ala Asn Ile Tyr Pro Leu
168      420      425      430
169 Ser Leu Leu Leu Asn Leu Gly Arg Arg Ser Lys Ile Gly Ser Asn Phe
170      435      440      445
171 Gln His Met Met Met Phe Ala Gly Leu Arg Gly Ala Met Ala Phe Ala
172      450      455      460
173 Leu Ala Ile Arg Asp Thr Ala Thr Tyr Ala Arg Gln Met Met Phe Ser
174 465      470      475      480
175 Thr Thr Leu Leu Ile Val Phe Phe Thr Val Trp Val Phe Gly Gly Gly
176      485      490      495
177 Thr Thr Ala Met Leu Ser Cys Leu His Ile Arg Val Gly Val Asp Ser
178      500      505      510
179 Asp Gln Glu His Leu Gly Val Pro Glu Asn Glu Arg Arg Thr Thr Lys
180      515      520      525
181 Ala Glu Ser Ala Trp Leu Phe Arg Met Trp Tyr Asn Phe Asp His Asn
182      530      535      540
183 Tyr Leu Lys Pro Leu Leu Thr His Ser Gly Pro Pro Leu Thr Thr Thr
184 545      550      555      560
185 Leu Pro Ala Cys Cys Gly Pro Ile Ala Arg Cys Leu Thr Ser Pro Gln
186      565      570      575
187 Ala Tyr Glu Asn Gln Glu Gln Leu Lys Asp Asp Asp Ser Asp Leu Ile
188      580      585      590
189 Leu Asn Asp Gly Asp Ile Ser Leu Thr Tyr Gly Asp Ser Thr Val Asn
190      595      600      605
191 Thr Glu Pro Ala Thr Ser Ser Ala Pro Arg Arg Phe Met Gly Asn Ser
192      610      615      620
193 Ser Glu Asp Ala Leu Asp Arg Glu Leu Ala Phe Gly Asp His Glu Leu
194 625      630      635      640
195 Val Ile Arg Gly Thr Arg Leu Val Leu Pro Met Asp Asp Ser Glu Pro
196      645      650      655
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198      660      665
201 <210> SEQ ID NO: 3
202 <211> LENGTH: 633
203 <212> TYPE: PRT
204 <213> ORGANISM: Artificial Sequence
206 <220> FEATURE:
207 <223> OTHER INFORMATION: Yeast - ScNhx1
209 <400> SEQUENCE: 3
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211 1      5      10      15
212 Thr Ala Lys Arg Ala Val Asp Pro Asp Asp Asp Asp Glu Leu Leu Pro
213      20      25      30

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214 Ser Pro Asp Leu Pro Gly Ser Asp Asp Pro Ile Ala Gly Asp Pro Asp
215          35          40          45
216 Val Asp Leu Asn Pro Val Thr Glu Glu Met Phe Ser Ser Trp Ala Leu
217          50          55          60
218 Phe Ile Met Leu Leu Leu Ile Ser Ala Leu Trp Ser Ser Tyr Tyr
219 65          70          75          80
220 Leu Thr Gln Lys Arg Ile Arg Ala Val His Glu Thr Val Leu Ser Ile
221          85          90          95
222 Phe Tyr Gly Met Val Ile Gly Leu Ile Ile Arg Met Ser Pro Gly His
223          100          105          110
224 Tyr Ile Gln Asp Thr Val Thr Phe Asn Ser Ser Tyr Phe Phe Asn Val
225          115          120          125
226 Leu Leu Pro Pro Ile Ile Leu Asn Ser Gly Tyr Glu Leu Asn Gln Val
227          130          135          140
228 Asn Phe Phe Asn Asn Met Leu Ser Ile Leu Ile Phe Ala Ile Pro Gly
229 145          150          155          160
230 Thr Phe Ile Ser Ala Val Val Ile Gly Ile Ile Leu Tyr Ile Trp Thr
231          165          170          175
232 Phe Leu Gly Leu Glu Ser Ile Asp Ile Ser Phe Ala Asp Ala Met Ser
233          180          185          190
234 Val Gly Ala Thr Leu Ser Ala Thr Asp Pro Val Thr Ile Leu Ser Ile
235          195          200          205
236 Phe Asn Ala Tyr Lys Val Asp Pro Lys Leu Tyr Thr Ile Ile Phe Gly
237          210          215          220
238 Glu Ser Leu Leu Asn Asp Ala Ile Ser Ile Val Met Phe Glu Thr Cys
239 225          230          235          240
240 Gln Lys Phe His Gly Gln Pro Ala Thr Phe Ser Ser Val Phe Glu Gly
241          245          250          255
242 Ala Gly Leu Phe Leu Met Thr Phe Ser Val Ser Leu Leu Ile Gly Val
243          260          265          270
244 Leu Ile Gly Ile Leu Val Ala Leu Leu Leu Lys His Thr His Ile Arg
245          275          280          285
246 Arg Tyr Pro Gln Ile Glu Ser Cys Leu Ile Leu Leu Ile Ala Tyr Glu
247          290          295          300
248 Ser Tyr Phe Phe Ser Asn Gly Cys His Met Ser Gly Ile Val Ser Leu
249 305          310          315          320
250 Leu Phe Cys Gly Ile Thr Leu Lys His Tyr Ala Tyr Tyr Asn Met Ser
251          325          330          335
252 Arg Arg Ser Gln Ile Thr Ile Lys Tyr Ile Phe Gln Leu Leu Ala Arg
253          340          345          350
254 Leu Ser Glu Asn Phe Ile Phe Ile Tyr Leu Gly Leu Glu Leu Phe Thr
255          355          360          365
256 Glu Val Glu Leu Val Tyr Lys Pro Leu Leu Ile Ile Val Ala Ala Ile
257          370          375          380
258 Ser Ile Cys Val Ala Arg Trp Cys Ala Val Phe Pro Leu Ser Gln Phe
259 385          390          395          400
260 Val Asn Trp Ile Tyr Arg Val Lys Thr Ile Arg Ser Met Ser Gly Ile
261          405          410          415
262 Thr Gly Glu Asn Ile Ser Val Pro Asp Glu Ile Pro Tyr Asn Tyr Gln

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VERIFICATION SUMMARY

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TIME: 15:05:21

Input Set : A:\0399.2004-002SEQLIST.TXT

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